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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/970,766	10/05/2001	Yasushi Yamazaki	110791	1937

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EXAMINER

HU, SHOUXIANG

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/970,766

Applicant(s)

YAMAZAKI ET AL.

Examiner

Shouxiang Hu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 10-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: _____

DETAILED ACTION

Election/Restriction

1. Claims 10-16 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 7.
2. Applicant's election with traverse of claims 1-9 in Paper No. 7 is acknowledged. The traversal is on the ground(s) that: the subject matter of all claims 1-16 is sufficiently related and that there is no serious burden placed on the Office to search and examine the entire application. This is not found persuasive as explained below.

Because the inventions of Group I (claims 10-16) and Group II (claims 1-9), as explained in the previous Office Action, are distinct and have acquired a separate status in the art as shown by their different classification, the search required for Group I is not required for Group II, and separated examination would be required. Furthermore, although only two subclasses were shown in the Restriction requirement in the previous Office Action, these are only the two representative ones. And, more and different subclasses and key word searches are required for each of the inventions of Group I and Group II, such as subclasses of 257/347-354 and 66-70, which are necessary for Group I; and 438/149, 455, 457-459, 464, 517, 976-978 and 766, which are necessary

for Group II. Significant burden would be imposed on the Examiner to search and examine both the Group I and Group II inventions.

The requirement in the previous Office action is still deemed proper and is therefore made FINAL.

Specification

3. The disclosure is objected to because of the following informalities:

On Page 20, line 16, the term of "1b" should read as --1c--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruel ("Bruel'835"; 5,494,835) in view of Bruel ("Bruel'564"; 5,374,564; of record).

Bruel'835 discloses a method of manufacturing a semiconductor substrate (See Figs. 1-4), comprising the processes of: forming an ion shield member having a predetermined shape on a semiconductor substrate (1; also see col. 4, lines 3-9); implanting ions into the semiconductor substrate main body to thereby form an ion implantation layer (4 and 7); removing the ion shield member (inherently included, as

Art Unit: 2811

evidenced in Fig. 3, where no ion shield member remains between the two substrates (1 and 11); laminating the semiconductor substrate (1) and a support substrate (11) onto each other; and separating the semiconductor substrate main body from the support substrate at the ion implantation layer.

Although Bruel'835 does not expressly disclose that the method can further include a step of forming an insulation film on the semiconductor substrate, one of ordinary skill in the art would readily recognize that an insulation film can be desirably formed on the semiconductor substrate for improving the quality of the laminated interface, as evidenced in Brue'564 (see col. 2, lines 61, through col. 3, lines 9).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to incorporating the step of forming an insulation film of Bruel' 564 into the method of Bruel'835 for making a semiconductor substrate, so that a semiconductor substrate with improved quality in its laminated interface would be obtained.

Regarding claim 2, it is noted that the kind of separation in Bruel'835 always tends to occur at a peak position of the ion concentration in the ion implantation layer (see Fig. 4)

Regarding claim 3, Bruel'835 further discloses that the ion shield member can be formed of a resin mask obtained by photolithography (col. 4, lines 3-6), which can be regarded as a resist layer.

Regarding claim 4, Bruel'835 further discloses that lens-shaped edges can be formed in the substrate through the ion-splitting method (see Figs. 9 and 10), which

•Art Unit: 2811

inherently requires an ion shield member having an outer edge tapered toward an outmost edge.

Regarding claim 5, the semiconductor substrate in Bruel'835 is single crystal silicon (col. 4, lines 33-34).

6. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruel ("Bruel'835"; 5,494,835) in view of Bruel ("Bruel'564"; 5,374,564; of record) as applied to claims 1-5 above, and further in view of Fukunaga (6,271,101).

The disclosures of Bruel'835 and Bruel'564 are discussed as applied to claims 1-5.

Although Bruel'835 and Bruel'564 do not expressly disclose that the supporting substrate can be formed of an optically transparent material such as glass or quartz, or that the support substrate can include a thermally conductive film, one of ordinary skill in the art would readily recognize that both glass and quartz are desirable supporting substrates for optical applications and that a thermally conductive film can desirably protect the substrate from thermal deterioration, as evidenced in Fukunaga (see col. 4, lines 36-50).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to incorporating the glass or quartz support substrate and/or thermal conductive film of Fukunaga into the semiconductor substrate collectively taught by Bruel'835 and Bruel'564, so that a semiconductor substrate

Application/Control Number: 09/970,766

Art Unit: 2811

capable for optical applications and/or with improved thermal stability would be obtained.

Conclusion

7. Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number is (703) 308-7722 or 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Shouxiang Hu** whose telephone number is **(703) 306-5729**. The examiner can normally be reached on Monday through Thursday from 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Tom Thomas**, can be reached on **(703) 308-2772**. The appropriate fax phone number for the organization where this application or proceeding is assigned is **(703) 308-7724**.

Art Unit: 2811

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

A handwritten signature in black ink, appearing to read 'Shouxiang Hu', with a stylized, cursive script.

Shouxiang Hu

July 25, 2002